SEQUENCE LISTING <1\0> CVITKOVITCH, Dennis SIGNAL PEPTIDES NUCLEIC ACID MOLECULES AND METHODS FOR TREATMENT OF CARIES <130> \311/0003 2\302 861 <140> <141> 2000-04-10 <160> 28 <170> PatentIn version 3.0 <210> 1 <211> 141 <212> DNA Streptococcus mutans <213> <220> <221> CDS <222> (1)..(141) <400> 1 atg aaa aaa aca cta tca tta aaa aat gac ttt aaa gaa att aag act Met Lys Lys Thr Leu Ser Leu Lys Asn Asp Phe Lys Glu Ile Lys Thr 48 10 gat gaa tta gag att atc att ggc gga agc gga agc cta tca aca ttt 96 Asp Glu Leu Glu Ile Ile Gly Gly Ser Gly Ser Leu Ser Thr Phe 30 ttc cgg ctg ttt aac aga agt ttt aca caa\gct ttg gga aaa taa 141 Phe Arg Leu Phe Asn Arg Ser Phe Thr Gln Ala Leu Gly Lys 35 40 <210> 2 <211> 46 <212> PRT <213> Streptococcus mutans <400> 2

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| | cca Pro | | | | | | | | | | | | | | | | 528 |
| tt: Le: | g tat ı Tyr | gtt Val | ata Ile 180 | gag Glu | agt Ser | tat Tyk | aat Asn | gtg Val 185 | ata Ile | ccg Pro | act Thr | tta Leu | aaa Lys 190 | ttt Phe | cgt Arg | į | 576 |
| aaa Lys | a ttt s Phe | gtc Val 195 | gtt Val | att Ile | gtc Val | tat Tyr | ctt Leu 200 | att Ile | tta Leu | ttt Phe | ttg Leu | att Ile 205 | ctg Leu | atc Ile | tca Ser | (| 524 |
| | tta e Leu 210 | | | | | | | | | | | | | | | (| 672 |
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| | a tct ı Ser | | | | | | | | | | | | | | | | 768 |
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| at Il | t gaa e Glu | aag Lys 275 | att Ile | tac Tyr | cat His | caa Gln | atc Ile 280 | tta Leu | gaa Glu | aaa Lys | aca Thr | gga Gly 285 | cat His | caa Gln | ttg Leu | i | 864 |
| | g gat n Asp 290 | Thr | | | | | | | | | | | | | | | 912 |
| gc Al 30 | t gtc a Val 5 | aag Lys | ggt Gly | atc Ile | ttg Leu 310 | tca Ser | gca Ala | aaa Lys | atc Ile | tta Leu 315 | gaa Glu | gct Ala | cag Gln | aat Asn | aaa Lys 320 | \ | 960 |
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| aaa Lys 385 | gaa Glu | aaa Lys | daa Glyn | ata Ile | gat Asp 390 | gtg Val | agt Ser | aaa Lys | att Ile | ttt Phe 395 | aaa Lys | gaa Glu | aac Asn | tat Tyr | tcc Ser 400 | 1200 |
| act Thr | aaa Lys | ggc Gly | tcc Ser | aat Asn 405 | cgc Arg | ggt Gly | att Ile | ggt Gly | tta Leu 410 | gca Ala | aag Lys | gtg Val | aat Asn | cat His 415 | att Ile | 1248 |
| ctt Leu | gaa Glu | cat His | tat Tyr 420 | ccc Pro | aaa Lys | acc Thr | agt Ser | tta Leu 425 | caa Gln | aca Thr | agc Ser | aat Asn | cat His 430 | cat His | cat His | 1296 |
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| Leu | Ser | Lys 35 | Lys | Glu | Leu | Thr | Leu 40 | Phe | Ser | Ile | Ser | Asn 45 | Phe | Leu | Ile | |

Met Ile Ala Val Thr Met Val Asn Val Asn Leu Phe Tyr Pro Ala Glu 50 60

Pro Leu Tyr Phe Ile Ala Leu Ser Ile Tyr Leu Asn Arg Gln Asn Ser 65 70 75 80

Leu Ser Leu Asn Ile Phe Tyr Gly Leu Leu Pro Val Ala Ser Ser Asp
85 90 95

Leu Phe Arg Arg Ala Ile Ile Phe Phe Ile Leu Asp Gly Thr Gln Gly
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Ile Val Met Gly Ser Ser Ile Ile Thr Thr Tyr Met Ile Glu Phe Ala 115 120 125

Gly Ile Ala Leu Ser Tyr Leu Phe Leu Ser Val Phe Asn Val Asp Ile 130 140

Gly Arg Leu Lys Asp Ser Leu Thr Lys Met Lys Val Lys Lys Arg Leu
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Ile Pro Met Asn Ile Thr Met Leu Yeu Tyr Tyr Leu Leu Ile Gln Val 165 170 175

Leu Tyr Val Ile Glu Ser Tyr Asn Val Ile Pro Thr Leu Lys Phe Arg
180 185 190

Lys Phe Val Val Ile Val Tyr Leu Ile Leu Phe Leu Ile Leu Ile Ser 195 200 205

Phe Leu Ser Gln Tyr Thr Lys Gln Lys Val Gln Ask Glu Ile Met Ala 210 215 220

Gln Lys Glu Ala Gln Ile Arg Asn Ile Thr Gln Tyr Ser Gln Gln Ile
225 230 235 240

Glu Ser Leu Tyr Lys Asp Ile Arg Ser Phe Arg His Asp Tyr Leu Asn
245 250 255

Ile Leu Thr Ser Leu Arg Leu Gly Ile Glu Asn Lys Asp Leu Ala Ser 260 265 270

Ile Glu Lys Ile Tyr His Gln Ile Leu Glu Lys Thr Gly His Gln Leu 275 280 285

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Gln Asp Thr Arg Tyr Asn Ile Gly His Leu Ala Asn Ile Gln Asn Asp
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Lys Ile Ala Val Asn Val Glu Val Ser Ser Lys Ile Gln Leu Pro Glu 325 330 335

Met Glu Leu Leu Asp Phe Ile Thr Ile Leu Ser Ile Leu Cys Asp Asn 340 345 350

Ala Ile Glu Ala Ala Phe Glu Ser Leu Asn Pro Glu Ile Gln Leu Ala 355 360 365

Phe Phe Lys Lys Asn Gly Sex Ile Val Phe Ile Ile Gln Asn Ser Thr 370 380

Lys Glu Lys Gln Ile Asp Val Ser Lys Ile Phe Lys Glu Asn Tyr Ser 385 390 395 400

Thr Lys Gly Ser Asn Arg Gly Ile Gly Deu Ala Lys Val Asn His Ile 405 410 415

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| | | | | | | gca Ala | | | | | | | | | | | _ <u>9</u> 6 _ |
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| | cct Pro | gaa Glu 50 | aag Lys | ggc Gly | aat Asn | cac His | cag Gln 55 | att Ile | ttc Phe | ttt Phe | ttg Leu | gat Asp 60 | att Ile | gaa Glu | atc Ile | aaa Lys | 192 |
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| | | | | | | att Ile | | | | | | | | | | | 288 |
| | | | | | | tat Tyr | | | | | | | | | | | 336 |
| | | | | | | gag Glu | | | | | | | | | | | 384 |
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| | att Ile 145 | ttc Phe | cat His | tca Ser | tct Ser | gaa Glu 150 | act Thr | cag Gln | ttt Phe | cag Gln | gtc Val 155 | cct Pro | ttt Phe | gct Ala | gag Glu | att Ile 160 | 480 |
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| | | | | | | gaa Glu | | | | | | | | | | | 576 |
| | | | | | | ttt Phe | | | | | | | | | | | 624 |
| | | | | | | att Ile | | | | | | | | | | | 672 |

aat aat aag tot tgt ott att toa oga act aag tta aca aaa otg aga Ash Asn Lys Ser Cys Leu Ile Ser Arg Thr Lys Leu Thr Lys Leu Arg 225 230 235

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750

720

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Lys Glu Leu Thr Ile Phe Gly Lys Pro Gln Gln Leu Ile Asp Ala Ile 35

Pro Glu Lys Gly Asn His Gln Ile Phe Phe Leu Asp Ile Glu Ile Lys 50 55

Lys Glu Glu Lys Lys Gly Leu Glu Val Ala Asn Gln Ile Arg Gln His 65

Asn Pro Ser Ala Val Ile Val Phe Val Thr Thr His Ser Glu Phe Met

Pro Leu Thr Phe Gln Tyr Gln Val Ser Ala Leu Asp Phe Ile Asp Lys 100 105

Ser Leu Asn Pro Glu Glu Phe Ser His Arg Ile Glu Ser Ala L'eu Tyr 115 120 125

Tyr Ala Met Glu Asn Ser Gln Lys Asn Gly Gln Ser Glu Glu Leu Phe 130 135

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145 150 155 160
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Leu Tyr Phe Glu Thr Ser Ser Thr Ala His Lys Leu Cys Leu Tyr Thr
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Tyr Asp Gu Arg Ile Glu Phe Tyr Gly Ser Met Thr Asp Ile Val Lys
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Met Asp Lys Arg Leu Phe Gln Cys His Arg Ser Phe Ile Val Asn Pro 195 200 205

Ala Asn Ile Thr Arg Ile Asp Arg Lys Lys Arg Leu Ala Tyr Phe Arg 210 220

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Phe Arg Leu Phe Asn Arg Ser Phe Thr Gln Ala Leu Gly Lys

WWW THOOP OF HOOP

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| | | tta Leu | | | | | | | | | | | | | | | 96 |
| | | caa Gln 35 | | | | | | | | | | | | | | : | 144 |
| | | tta Leu | | | | | | | | | | | | | | · | 192 |
| | | tct Ser | | | | | | | | | | | | | | ; | 240 |
| | | cgt Arg | | | | | | | | | | | | | | : | 288 |
| | | ttg Leu | | | | | | | | | | | | | | | 336 |
| | | agt Ser 115 | | | | | | | | | | | | | | | 384 |
| | | ttt Phe | | | | | | ggag | gagca | act t | tttg | ggaa | ag go | caaag | gtatg | | 438 |
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Trp Lys Leu Ser Arg Tyr Tyr Phe Ile Lys Met Trp Thr Arg Glu Asp
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-- Trp Gln-Gln-Glu-Gly Met Leu_Ile_Leu_His Gln_Leu_Leu_Arg_Glu_His 35 40 45

Pro Glu Leu Glu Glu Asp Asp Thr Lys Leu Tyr Ile Tyr Phe Lys Thr 50 55 60

Arg Phe Ser Ash Tyr Ile Lys Asp Val Leu Arg Gln Gln Glu Ser Gln 65 70 75 80

Lys Arg Arg Phe Asn Arg Met Ser Tyr Glu Glu Val Gly Glu Ile Glu 85 90 95

His Cys Leu Ser Ser Gly Gly Met Gln Leu Asp Glu Tyr Ile Leu Phe
100 105 110

Arg Asp Ser Leu Leu Ala Tyr Lys Gln Gly Leu Ser Thr Glu Lys Gln
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SSETT BULLER

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| Leu Leu Glu Ile Ile Lys Arg Val Thr Lys Arg Gly Gly Thr Val Ser | |
| tca tct aat cct tta cca gat ggg cag tct aag ttg ttt tgg cgc aga | 144 |
| Ser Ser Asn Pro Leu Pro Asp Gly Gln Ser Lys Leu Phe Trp Arg Arg 35 40 45 | |
| cat tat aag cta gta cct cag att gat acc aga gac tgt ggg ccg gca | 192 |
| His Tyr Lys Leu Val Pro Gln Ile Asp Thr Arg Asp Cys Gly Pro Ala | |
| 50 55 60 | |

| | | | | | | | | cat His | | | | | | | | | 240 |
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| | | | | | | | | aag Lys | | | | | | | | | 336 |
| و | | | | | | | | gat Asp 120 | | | | | | | | | 384 |
| • | | | | | | | | aaa Lys | | | | | | | | | 432 |
| | | | | | | | | ctg Leu | | | | | | | | | 480 |
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| | | | | | | | | cct Pro | | | | | | | | | 576 |
| | | _ | | | | _ | | aat Asn 200 | | - 11 | - | _ | | | | - | 624 |
| | | _ | • | _ | | | | atc Ile | | _ | - " | _ | | | _ | | 672 |
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| | | | | | | | | cgt Arg 280 | | | | | | | | | 864 |
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| | | | | | aca Thr 405 | _ | | | _ | V- | | | | | _ | _ | : | 1248 |
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tat Ser Phe Glu Asn Leu Ser tte tat aaa aaa tca gat att aat tta ser Gly ser Gle Lys L | ceg the gaa aat below as below ser bee show show show show show show show show | tca gat att aat tca ser system for the tat gat aaa att gga att ser system for | Cog ttt gaa aat ctt tct tat aaa tat gga ttt ggg Ser Phe Glu Asn Leu Ser Tyr Lys Tyr Gly Phe Gly 540 tca gat att aat taa tca aaa aaa aga ggc tcc aag gar gcc agt ggt tct ggt aaa aca act ttg gct aaa Gly Ala Ser Gly Lys Thr Thr Leu Ala Lys tc tac gag cct aac aag ggg att ttg cga act aat dhe Tyr Glu Pro Asn Lys Gly Lys Thr Thr Leu Arg det aat aa | Ser Phe Glu Asn Leu Ser Tyr Lys Tyr Gly Phe Gly Arg 530 tca gat att aat tta tca atc aaa aca acg gct cc aag gtc Ser Asp He Asn Leu Ser He Lys Lys Gly Ser Lys Val 545 gga gcc agt ggt tct ggt aaa aca act ttg gct aaa ctg Gly Ala Ser Gly Ser Gly Lys Thr Thr Leu Ala Lys Leu 565 ttc tac gag cct aac aag ggg att gtt cga atc aat ggc he Tyr Glu Pro Alan Lys Gly Ile Val Arg Ile Asn Gly 585 aaa gtt att gat aag aca 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His Tyr Lys Leu Val Pro Gln Ile Asp Thr Arg Asp Cys Gly Pro Ala 50 55 60

Val Leu Ala Ser Val Ala Lys His Tyr Gly Ser Asn Tyr Ser Ile Ala 65 70 75 80

Tyr Leu Arg Glu Leu Ser Lys Thr Asn Lys Gln Gly Thr Thr Ala Leu 85 90 95

Gly Ile Val Glu Ala Ala Lys Lys Leu Gly Phe\Glu Thr Arg Ser Ile
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Lys Ala Asp Met Thr Leu Phe Asp Tyr Asn Asp Leu Thr Tyr Pro Phe 115 120 125

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Tyr Gly Ser Gln Asn Asn Gln Leu Ile Ile Gly Asp Pro Asp Pro Ser 145 150 155

Val Lys Val Thr Arg Met Ser Lys Glu Arg Phe Gln Ser Glu Trp Thr
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Lys Ala Leu Met Thr Tyr Ile Ile Ile Ala Ser Leu Ile Val Thr Leu 210 215 220

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Ile Pro Asp Gln Leu Ile Ser Thr Leu Gly Met Ile Thr Ile Gly Leu
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Ile Ile Thr Tyr Ile Ile Gln Gln Val Met Ala Phe Ala Lys Glu Tyr 260 265 270

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Tyr Ile Lys His Ile Phe Thr Leu Pro Met Ser Phe Phe Ala Thr Arg 290 295 300

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Asp Ala Val Ala Ser Thr Ile Phe Ser Ile Phe Leu Asp Met Thr Met 325 330 335

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Glu Phe Val Asp Tyr Leu Glu Lys Asn Phe Lys Leu His Lys Tyr Ser 420 425 430

Ala Ile Gln Thr Ala Leu Lys Ser Gly Ala Lys Leu Ile Leu Asn Val

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Val Ala Asn Thr Arg Leu Asn Glu Val Tyr Leu Val Glu Ser Glu Phe 500 510

Glu Lys Asp Gly Asp Leu Ser Glu Asn Ser Phe Leu Asp Gly Asp Ile
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Ser Asp Ile Asn Leu Ser Ile Lys Lys Gly Ser Lys Val Ser Leu Val 545 550 555 560

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Phe Tyr Glu Pro Asn Lys Gly Ile Val Arg Ile Asn Gly Asn Asp Leu 580 585 590

Lys Val Ile Asp Lys Thr Ala Leu Arg Arg His Ile Ser Tyr Leu Pro
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Gln Gln Ala Tyr Val Phe Ser Gly Ser Ile Met Asp Asn Leu Val Leu

Gly Ala Lys Glu Gly Thr Ser Gln Glu Asp Ile Ile Arg Ala Cys Glu 625 630 635 640

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Thr Glu Leu Ser Asp Gly Ala Gly Ile Ser Gly Gly Gln Lys Gln Arg
660 665 670

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690 700

Ser Asn Leu Leu Gln Met Thr Glu Lys Thr Ile Ile Phe Val Ala His 705 710 715 720

Arg Leu Ser Ile Ser Gln Arg Thr Asp Glu Val Ile Val Met Asp Gln 725 730 735

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| $Q_{i,\lambda}$ | | | gtc Val 35 | | | | | | | | | | | | | 144 |
| 36 | | | ggt Gly | | | | | | | | | | | | | 192 |
| , | | | gac Asp | | | | | | | | | | | | | 240 |
| | | | aag Lys | | | | | | | | | | | | | 288 |
| | | _ | cag Gln | | _ | | _ | | | • | | | _ | | | 336 |
| 10 mg | | | aag Lys 115 | | | | | | | | | | | | | 384 |
| | | _ | agc Ser | _ | | _ | | | | _ | | _ | ` | _ | | 432 |
| Transfer 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | agc Ser | | | | | | | | | | | | | 480 |
| | | | tca Ser | | | | | | | | | | | | | 528 |
| | _ | | att Ile | | _ | _ | | | | | _ | | | | - (| 576 |
| | | | aaa Lys 195 | | - | | | | | | | | - | | - \ | 624 |
| | | | gtt Val | | | | | | | | | | | | | 6,45 |

| | | | | | | | | | | | | • | | | | | |
|------------|-------------------|------------|-------------------|-------------------|-------------------|-------------------|------------|-------------------|-------------------|-------------------|-------------------|------------|-------------------|-------------------|-------------------|-------------------|-----|
| | aaa Lys 225 | aag Lys | gga Gly | aat Asn | gac Asp | aag Lys 230 | gtt Val | gtt Val | att Ile | gaa Glu | gga Gly 235 | aaa Lys | att Ile | aac Asn | aat Asn | gtc Val 240 | 720 |
| | gct Ala | tca Ser | tca Ser | gca Ala | act Thr 245 | act Thr | act Thr | aaa Lys | aaa Lys | gga Gly 250 | aat Asn | ctc Leu | ttt Phe | aag Lys | gtt Val 255 | act Thr | 768 |
| Tue T | gcc Ala | aaa Lys | gta Val | aag Lys 260 | gtt Val | tct Ser | aag Lys | aaa Lys | aat Asn 265 | agc Ser | aaa Lys | ctc Leu | atc Ile | aag Lys 270 | tat Tyr | ggt Gly | 816 |
| | atg Met | aca Thr | ggc Gly 275 | aag Lys | aca Thr | gtc Val | act Thr | gtc Val 280 | att Ile | gat Asp | aaa Lys | aag Lys | act Thr 285 | tat Tyr | ttt Phe | gat Asp | 864 |
| | | | aaa Lys | | | | | | | | | | | | | | 900 |
| | | | | | | | | | | | | | | | | | |
| | <210 |)> : | 28 | | | | 1 | \ | | | | | | | | | |
| : T | <21 | l> | 300 | | | | | | | | | | | | | | |
| | <212 | 2> | PRT | | | | | | | | | | | | | | |
| | <213 | 3 < | Strep | atoco | מרכוו! | s mui | tans | ' | | | | | | | | | - |
| | 421. |) / | ocrej | JEOCK | occu. | 3 mai | camb | | | | | | | | | | |
| <u>i</u> | | | | | | | | | | | | | | | | | |
| 74.5 35 | <40 | 0> | 28 | | | | | | | | | | | | | | |
| | Met 1 | Asp | Pro | Lys | Phe 5 | Leu | Gln | Ser | Ala | GÌu 10 | Phe | Tyr | Arg | Arg | Arg 15 | Tyr | |
| | His | Asn | Phe | Ala 20 | Thr | Leu | Leu | Ile | Val 25 | Pro | Leu | Val | Cys | Leu 30 | Ile | Ile | |
| | Phe | Leu | Val 35 | Ile | Phe | Leu | Cys | Phe 40 | Ala | Lys | Lys | Glu | Ile 45 | Thr | Val | Ile | |
| | Ser | Thr 50 | Gly | Glu | Val | Ala | Pro 55 | Thr | Lys | Val | Val | Asp 60 | Va ₁ | Ile | Gln | Ser | |
| | Tyr | Ser | Asp | Ser | Ser | | Ile | Lys | Asn | Asn | Leu 75 | Asp | Asn | Asn | Ala | Ala 80 | |
| | 65 | | | | | 70 | | | | | , , | | | | | | |

Asn Arg Gln Thr Glu Gln Lys Asn Ile Ile Lys Glu Arg Gln Lys Arg

Ser Lys Ser Lys Lys Ala Ser Lys Asp Lys Lys Lys Ser Lys Asp 130 135 140

Lys Glu Ser Ser Ser Asp Asp Glu Asn Glu Thr Lys Lys Val Ser Ile

Phe Ala Ser Glu Asp Gly Ile Ile His Thr Asn Pro Lys Tyr Asp Gly
165 170 175

Ala Asn Ile Ile Pro Lys Glh Thr Glu Ile Ala Gln Ile Tyr Pro Asp 180 185 190

Ile Gln Lys Thr Arg Lys Val Leu Ile Thr Tyr Tyr Ala Ser Ser Asp 195 200 205

Asp Val Val Ser Met Lys Lys Gly Gln Thr Ala Arg Leu Ser Leu Glu 210 215 220

Lys Lys Gly Asn Asp Lys Val Val Ile Glu Gly Lys Ile Asn Asn Val 225 230 245

Ala Ser Ser Ala Thr Thr Lys Lys Gly Asn Leu Phe Lys Val Thr
245 250 255

Ala Lys Val Lys Val Ser Lys Lys Asn Ser Lys Leu Ile Lys Tyr Gly
260 265 270

Met Thr Gly Lys Thr Val Thr Val Ile Asp Lys Lys Thr Tyr Phe Asp 275 280 285

Tyr Phe Lys Asp Lys Leu Leu His Lys Met Asp Asn 290 295 300